



AUDIT REPORT
Of the
Collider Accelerator Department (C-A)
OCCUPATIONAL SAFETY AND HEALTH (OSH)
MANAGEMENT SYSTEM

Performed by:

Signature on File

R. Savage, Auditor

Approved by

Signature on File

R. Karol

C-A ESHQ Division Head

Signature on File

E. Lessard

C-A ESHQ, Chair

Signature on File

D. Lowenstein

Collider-Accelerator Department Chairman

Date Submitted: September 12, 2003

Audit Dates: September 2 - 5, 2003

1.0 ASSESSMENT PURPOSE

This assessment was conducted to determine whether the Collider-Accelerator Department Occupational Safety and Health (OSH) Management System written program addresses OSHA ILO-OH-2001, Guidelines on Occupational Safety and Health Management requirements. In addition, this assessment focused on the programs instructional guidelines established to protect the safety and health of workers and systems to prevent accidents.

2.0 ASSESSMENT SCOPE

The scope of the audit encompassed an evaluation of the following Collider-Accelerator Department Occupational Safety and Health (OSH) Management System elements:

- a. OSH Policy
- b. Worker Participation
- c. Responsibility and Accountability
- d. Competence and Training
- e. OSH Management System Documentation
- f. Communication
- g. System Planning, Development and Implementation
- h. Prevention and Control Measures
- i. Management of Change
- j. Emergency Prevention, Preparedness and Response
- k. Procurement
- l. Contractor
- m. Performance Monitoring and Measurement
- n. Investigation of Work Related Injuries, Ill Health, Diseases and Incidents, and their Impact on Safety and Health Performance
- o. Audit
- p. Management Review
- q. Preventive and Corrective Action
- r. Continual Improvement

3.0 SUMMARY

On May 1, 2003, C-AD expanded its Environmental, Safety and Health Policy to include OPM 1.10.4, OSH Management System Program Description, which incorporated ILO-OSH-2001 and OSHAS-18001 requirements. This audit of the C-A OSH Management System was performed to determine if the written program properly addresses each of the elements identified in OSHA ILO-OSH-2001 and OSHAS-18001. To achieve this task, each of the eighteen (18) elements identified in the scope of this audit were reviewed for compliance, and effectiveness in meeting C-A OSH Policy and Objectives. Based on audit observations, the C-A OSH Management System written program is being implemented, with strong managerial support for achieving OSH objectives and targets. The program is being integrated into everyday activities through Operating Procedures and via the Work Planning and Control Process. C-A Management has established a Worker Occupational Safety and Health (WOSH) Committee, which is charged with ensuring worker concerns. Ideas and inputs related to OSH are received, considered and responded to by the Committee. In addition, the WOSH Committee members are responsible for maintaining communication with their respective staff, by keeping them informed of all OSH policies, objectives and on-going related issues.

The C-AD Occupational Safety and Health (OSH) Management System elements reviewed are being implemented in accordance with procedure requirements. The exceptions noted below represent four (4) areas that require management attention in order to fully implement the OSH program:

1. Currently, there is a DOE/Laboratory initiative to determine the magnitude of additional funds necessary for implementing all of the OSHA regulations that relate to facility improvements. The Department should begin to plan for these improvements and encourage BNL to develop a strategy for preparing technical justifications that demonstrate an equivalent level of safety if facilities can't be changed.
2. The laboratory needs to develop a BNL OSH SBMS Subject Area. Once the laboratory completes this effort, C-A will need to review their OSH procedures against the subject area to ensure both agree. The C-A ESHQ Associate Chair should bring this issue forward to upper management.
3. C-A OSH Training is under development. The training process is scheduled for completion during the 4th quarter of 2003. After the facility specific training is completed, the Department should continue to conduct safety awareness events for the staff on a quarterly basis such as showing the "Remember Charlie" video or reviewing lessons learned from a recent occurrence or injury.
4. Based on C-A trending analysis, outside ground hazards (e.g. ice, snow, rough walkways) have been identified as the major cause for worker lost time and first aid cases in 2003. The C-A ESHQ Associate Chair should bring this issue forward to upper management.

3.1 A Summary of each of the program elements follows:

A. OSH Policy

On February 11, 1997, the C-AD safety policy was documented formally in OPM 1.10, which described the process used to address safety and health issues. Prior to 1997, to ensure C-A commitment to protecting the safety and health of all employees, users and guests, C-A Safety Committee's (Radiation Safety Committee, Experimental Safety Committee, Accelerator Systems Safety Committee, Safety Inspection Committee, and ALARA Committee) addressed all safety and health issues in accordance with their respective procedure requirements.

In 2003, C-AD expanded its safety policy, which was based on DOE Order 450.4 Safety Management System Policy, to include requirements from ILO-OSH-2001 and OSHAS-18001.¹ This initiative was prompted by Brookhaven National Laboratory's concern over increasing injuries and worker compensation cases in 2002. The revised C-A Occupational, Safety and Health (OSH) program not only includes management but supervisory and worker participation as well.² This partnership / ownership in the OSH program will ensure all personnel are knowledgeable of safety issues and committed to working safely. The new OSH Management System program consists of twenty-one (21) new documents, which address OSH Management Plans, Training requirements, Assessment Review criteria, Operational Controls and record keeping requirements. At the time of this audit, only two remaining OSH procedures (OSH Audit procedure and Work Related Injury procedure) are in process and scheduled for issuance during the 4th quarter of 2003.

The laboratory has established a Director's Safety Committee (DSC), with the primary function to provide safety leadership at the management level and focus on leading the laboratory on the path towards safety excellence. To assist the DSC fulfill its mission, a Safety Improvement Team which consists of employees from different laboratory departments including C-AD was established to formulate a strategic plan to make BNL a safer work place. Additionally, due to pending external regulation by OSHA, the laboratory is focusing on a DOE/Congressional initiative to determine the magnitude of additional funds necessary for bringing all facilities, some of which were built in the 1940's, up to present-day OSHA requirements.

¹ ILO-OSH-2001, Guidelines on Occupational Safety and Health Systems, International Labour Office, Geneva, 2001. OHSAS 18001:1999, Occupational Health and Safety Management Systems – Specifications, British Standards Institution, Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado 80112, Amended December 2002.

² [OPM 1.10.4, OSH Management System Program Description](#).

B. Worker Participation

Workers are trained on all OSH aspects associated with their respective JTA and daily work activities. The work planning process covers specific OSH requirements associated with specific job tasks, including enhanced work permits requiring read and acknowledgement by the individual performing the task. In addition, C-A Management has established a WOSH Committee that has twenty-six (26) C-A members, all of which are workers that represent each of the C-A Sections / Groups. The WOSH Committee's main objective is to review occupational, safety and health issues, recommend methods to correct weaknesses and promote good work practices. This process provides continuous improvement to individual workers, management and the overall OSH Program. Presently, the WOSH Committee has met once, at which time members elected a WOSH Committee Chair and appointed Secretary.

In addition, procedures for receiving, documenting and responding appropriately to worker communications related to OSH topics were developed and C-A injury statistics were discussed. The next WOSH meeting is scheduled for the 3rd quarter of 2003.

C. Responsibility and Accountability

C-A Management has overall responsibility for the protection of workers' safety and health, and provides leadership for OSH activities within the organization. C-A Management allocates responsibility, accountability and authority for the development, implementation and performance of the OSH Management System and Objectives. To accomplish this task, C-A has developed and implemented procedures that define these roles and respective responsibilities (e.g. OPM 1.10, C-A Environmental, Safety and Health Policy, OPM 1.10.4.a, Collider-Accelerator OSH Document Flow Down Matrix, OPM 13.1.1, Quality, OSH and Environmental Management Systems). Specific R2A2s for OSH have been summarized and are located at http://www.rhichome.bnl.gov/AGS/Accel/SND/osh_management_system.htm. C-A Management has arranged for full participation of their workers in the fulfillment of the C-A OSH policy.

D. Competence and Training

All employees and users receive facility specific training in accordance with C-A OPM 1.12, Conduct of Training Policy requirements. In addition, to facility specific training, all new employees receive Emergency Planning and Response, Environmental Protection and Stop Work Training. Additional job specific training for known hazard processes is provided to individuals based on their respective JTA requirement(s).

OSH related training, as defined in Brookhaven Training Management System (BTMS) and OPM 1.10.4, is provided to all employees, guests, contractors and users working in C-A facilities. Discussion with the C-A Training Manager revealed JTA's for four (4) categories (e.g. Accelerators, Experimental Areas, Shops and Offices) are under development and scheduled for completion during the 4th quarter of 2003. This training will require small group interfacing to ensure all personnel OSH training needs are addressed, especially since C-A employees may work in more than one of the four categories. A WOSH Committee JTA was established and WOSH Committee Members have presently received trained information.

E. OSH Management System Documentation

C-A OSH document control system is in accordance with SBMS Internal Controlled Documents Subject Area and C-A supplemental procedures OPM 1.1, Authorization, OPM 1.2, C-A Documents, OPM 1.4, Document Control "Series" OPM's and OPM 13.4.1 Records Management Section requirements. OSH records have been identified, with the responsible record custodian and retention period in accordance with DOE record schedule requirements.

A review of WOSH Committee records (e.g. minutes, action items, safety concern correspondence, worker compensation case reports, and WOSH presentation/slides) is in place as required.

F. Communication

A review of OSH procedures confirmed a system is in place for receiving, documenting and responding to internal and external communications. It was noted that the OSH procedure instructions have placed an emphasis on communicating the fact that the success of the OSH program relies on all relevant levels of the C-A Department for ensuring that concerns, ideas and inputs of workers are received, reviewed and responded to as required. To ensure issues are addressed and appropriate action(s) are taken, items are tracked on the C-A family ATS system.

To further enhance the OSH program, weekly supervisor meetings are held to discuss daily planned work tasks, associated hazards and environmental issues personnel may encounter during the performance of their activities. In addition to C-A group web pages, an OSH comment box has been installed in the 911A lobby area, for personnel to submit safety concerns or questions that are forwarded to the newly formed WOSH Committee for review and action as applicable.

G. System Planning, Development and Implementation

This review did demonstrate with the exception for cost restraints for facility upgrades, C-A management commitment to comply with applicable regulations including continual improvement in OSH performance. OSH objectives are clearly defined and are reasonably achievable. Presently, budget restraints are the major barrier to fully implementing facility improvements such as roof repair. However, C-A and Laboratory managements are aware of these facility improvement issues.

H. Prevention and Control Measures

C-A safety and health risk/hazard controls are properly addressed in C-A operations and work planning procedures. Administrative and engineering controls have minimized hazards by providing personnel with up-to-date procedures that reflect current conditions, laboratory and regulatory requirements. In addition, protective equipment (e.g. hardhats, safety glasses, safety shoes, hearing protection) is available to personnel to ensure workers are safely protected while performing hazardous work tasks. Based on C-A performance indicator trends, outside ground hazards (e.g. ice, rough walkway surfaces, loose railings) have been the major cause for worker lost work time (2 injuries) and 18 first aid cases in 2003. Based on data for $\frac{3}{4}$ of the work year, the present lost work rate is 0.9 per 100 FTE's and the C-A Goal is 0.6 for the year.

I. Management of Change

The impact on OSH of internal and external changes (e.g. staffing, new processes, procedures, organizational structure, and regulatory amendments) is evaluated and applicable steps are taken prior to implementing the changes. Changes to accelerators and experiments are assessed by various safety committees for safety and health issues as well as new work methods, materials, processes and machinery in accordance with procedure requirements. The C-A Quality Assurance Department verifies these controls annually. To ensure C-A is aware of new/revised regulatory changes, appropriate staff of C-A Department subscribes to the SBMS Subscription Service, which identifies new/revised legal or other regulatory requirements for the laboratory. In addition, BNL Subject Matter Experts are used as C-A safety review committee members to assist in the evaluation process.

J. Emergency Prevention, Preparedness and Response

C-A emergency preparedness and response program, identified in C-A OPM Chapter 3, supplements the Laboratory Emergency Plan identified in the Emergency Preparedness Subject Area. Review of these procedures revealed they are unique to the C-A complex. Basically the procedures are intended to inform personnel on emergency actions to take for most potential accidents/incidents that may arise within the C-A facility. The procedures also address OSH risks associated with the emergency scenario. Each year the C-A Department participates in an annual emergency response drill. This year the drill is scheduled for late September or early October.

K. Procurement

A review of procurement procedures (e.g. OPM Chapter 13) regarding purchasing goods and/or services was performed and found in accordance with SBMS Subject Area requirements. The procurement process is a web base system with built-in controls, requiring assigned passwords and for specific safety and health items, additional information is required prior to the review and approval process. The procurement requisition is then electronically sent to appropriate staff for review and approval, prior to pinning the requisition. The C-A Administrative Staff also monitors credit card usage to ensure safety and health products such as chemicals are not purchased using this method or prior approval is given by BNL CMS. This practice not only allows C-A and BNL to control chemical inventories, but also ensures chemicals are reviewed properly by ESH Coordinators and deemed safe for use, prior to purchase.

L. Contractor

This audit verified that a training system is in-place to ensure contractors and/or suppliers receive applicable Safety and Health training prior to commencing work on site. In addition, either an assigned C-A liaison engineer or C-A ESHQ Division member monitors contractors and/or suppliers OSH performance in accordance with C-A procedure requirements.

M. Performance Monitoring and Measurement

A review of OSH performance monitoring and measurement procedures (e.g. OPMs 1.10.4.a, 9.4.1, 9.4.2, 9.4.5, 13.10.1) revealed overall monitoring and measurement of OSH hazards and performance is in accord with C-A and SBMS Subject Area requirements. It was noted that responsibility, accountability and authority of performing monitoring and measurement tasks is well defined at different levels in the C-A management and worker structures. Processes are in place that allows proper feedback on OSH performance, hazard and risk identification, prevention and corrective action implementation. In addition, identification and investigation into accident/incident work related injuries are in-place and implemented in accord with C-A OPM 9.4.5, "C-A Accident/Incident Investigation" requirements.

N. Investigation of Work Related Injuries, Ill Health, Diseases and Incidents, and their Impact on Safety and Health Performance

In 2003, C-A and the laboratory have focused on reducing work related injuries. This element is identified in C-A performance indicators, which are trended on a quarterly basis using different categories (e.g., recordable injury and illness cases, general safety, electrical safety, housekeeping, chemical safety, fire protection, working environment, radiation safety, personnel protection, unsafe practices, outside ground deficiencies and satellite area concerns). These are trended against 2002 findings of the same categories. Based on the trending data, to date, the most significant hazard appears to be outside ground deficiencies (e.g., ice, walk ways, railings, etc.), which seem to have caused the most personnel injuries.

O. Audit

The C-A Quality Assurance office performs an annual audit of the OSH Management Program in accordance with ILO-OSH-2001, Guidelines on Occupational Safety and Health Management Systems requirements. This year all eighteen (18) elements (identified in the scope of this audit) are reviewed due to the recently implemented program. Thereafter, six (6) elements will be reviewed at random until all 18 OSH elements are assessed over a 3-year period. As applicable, audit results will be communicated to those personnel responsible for corrective action. Depending on audit results, additional assessments may be requested by C-A Management. Each OSH assessment will determine if the OSH Management System elements audited are effective in meeting the following criteria:

- a. Effective in meeting C-AD's OSH Policy and Objectives
- b. Effective in promoting worker participation
- c. Able to achieve compliance with relevant laws and regulations
- d. Able to fulfill goals of continual improvement and best OSH practices
- e. Able to respond to the results of OSH performance evaluation and previous audits

P. Management Review

The OSH Management Review program, which encompasses EMS and the Self-Assessment Management Review, was examined during the ISO 14001 site audit and found in compliance with procedure requirements. The review process includes OSH policy and objectives, and provides feedback on OSH priorities, for planning and continual improvement to the overall program. The OSH Management Review focus is on work-related injuries, incident investigations, ill health, diseases, performance monitoring and measurement of audit activities. Internal and external input including organizational changes that could affect the OSH management system is also included in this annual review.

Q. Preventive and Corrective Action

A list of OSH non-conformances is the output of the OSH management system performance monitoring and measurement process. Each non-conformance root cause is analyzed against OSH regulations and OSH management system procedures, to ensure adequate corrective and prevention actions are taken. Presently, the C-A Department documents its OSH non-conformances using either the C-A ATS System, Procedure for Conducting Safety Inspections (OPM 9.4.1), the Occurrence Reporting and Processing (ORPS) System (OPM 10.0) or the Critique Subject Area. Each one of these systems track the non-conformance until corrective action is properly taken to close out the item. If the ORPS system is used to identify a non-conformance, a root cause analysis is required. Non-ORPS conditions are documented using critiques, which may become part of a formal investigation of accidents or incidents. I note this element was also reviewed during the ISO 14001 site audit and found to be in compliance with procedural requirements.

R. Continual Improvement

The overall OSH program outcome is an injury-free workplace. Thus, continual improvement to the OSH program is an objective. To accomplish this task, the OSH Management System has many avenues in which continual improvement is achieved. The results from Management Reviews, hazard and risk assessments, audits, self-assessments, performance monitoring, work-related injury investigations, WOSH Committee recommendations, laboratory Lessons Learned Program or laboratory initiatives and changes in laws or regulations are some of the avenues that provide management with recommendations to improve. Several of these avenues are forward-looking, that is, they are intended to provide assurance that accidents will not happen in the future (e.g., Management Review). Several avenues are backward looking, that is, they measure injury rates or OSH violations, but in themselves they do not help assure against injuries in the future. Additionally, each year an assessment of the hazards in C-A workplaces (e.g. Accelerators, Experimental Areas, Offices and Shops) is performed, which is very similar to the Environmental Management System (EMS) analysis. Based on the hazard assessment, programs are defined and personnel assigned to further reduce the potential for injuries.

4.0 ASSESSMENT RESOLUTIONS

A summary of the assessment and associated observations were addressed. It was agreed that the four observations mentioned in the Summary (Section 3.0) would be entered into the ATS program and tracked until closure.

5.0 LIST OF ATTACHMENTS

Attachment A – List of Personnel Interviewed

ATTACHMENT A

<u>List of Personnel Interviewed</u>	<u>Responsibility</u>
P. Cirnigliaro	C-A Safety Engineer
R. Karol	C-A ESHQ Division Manager
J. Maraviglia	C-A Training Manager
D. Passarello	C-A QA Manager
A. Piper	C-A Work Controls Coordinator
J. Scott	C-A Environmental Protection Engineer
P. Sparrow	C-A WOSH Chairman